

### **AMENDMENTS TO THE CLAIMS**

*The listing of claims will replace all prior versions and listings of claims in the application:*

#### **Listing of Claims:**

1.     **(Currently Amended)**     A long wavelength vertical cavity surface emitting laser (VCSEL) comprising:
  - a first mirror comprising In and having at least about 25 mirror pairs;
  - an active area situated above said first mirror, the active region comprising In and being configured to emit light at a long wavelength in a range from about 1200 nanometers to about 1800 nanometers;
  - a dielectric layer situated above said active area and defining an electrically confining aperture, the dielectric layer having a configuration and a composition compatible with depositing the dielectric layer using a masking technique, wherein the dielectric layer comprises a ~~ing a non-aluminum~~ dielectric material selected from the group consisting of SiO<sub>2</sub>, TiO<sub>2</sub>, SiN, and combinations thereof; and
  - a second mirror above said dielectric gain guide, the second mirror comprising In and having at least about 25 mirror pairs.
2.     **(Previously Presented)**     The VCSEL of claim 1, further comprising:
  - a substrate; and
  - wherein said first mirror is situated above said substrate; and
  - said substrate comprises InP.
3.     **(Previously Presented)**     The VCSEL of claim 2, wherein said non-aluminum dielectric material provides optical confinement.
4.     **(Cancelled)**
5.     **(Previously Presented)**     The VCSEL of claim 1, further comprising:

a substrate; and

wherein:

said mirror is situated above said substrate; and

said substrate comprises GaAs.

6. **(Previously Presented)** The VCSEL of claim 5, wherein said non-aluminum dielectric material provides optical confinement.

7. **(Previously Presented)** The VCSEL of claim 6, wherein said non-aluminum dielectric material is selected from the group consisting of SiO<sub>2</sub>, TiO<sub>2</sub>, SiN, and combinations thereof.

8. **(Withdrawn)** A method for making a gain guide for a VCSEL comprising:

forming a first mirror above a substrate;

forming an active region above said first mirror;

depositing a mask and a dielectric material above the active region, wherein the mask provides a pattern for forming an aperture in the dielectric material;

forming an aperture in the dielectric material according to the mask so as to form a dielectric gain guide; and

forming a second mirror above said dielectric gain guide.

9. **(Withdrawn)** The method of claim 8, wherein the dielectric material comprises at least one of SiO<sub>2</sub>, TiO<sub>2</sub>, or SiN.

10. **(Withdrawn)** The method of claim 8, wherein the first and second mirrors are distributed Bragg reflectors.

11. **(Withdrawn)** The method of claim 10, wherein the first mirror is at least nearly lattice matched to the substrate.

12. **(Withdrawn)** The method of claim 11, wherein the substrate comprises InP.

13. **(Withdrawn)** The method of claim 11, wherein the substrate comprises GaAs.

14. **(Currently Amended)** A long wavelength vertical cavity surface emitting laser for providing laser light comprising:

first reflecting means, situated above a substrate, for reflecting light;

active means, situated above said first reflecting means, for converting current to light the active means being configured to emit light at a long wavelength in a range from about 1200 nanometers to about 1800 nanometers;

confinement means, situated above said active means, for confining current, the confinement means having a configuration and a composition compatible with depositing the confinement means using a masking technique, wherein the confinement means comprises a dielectric material selected from the group consisting of SiO<sub>2</sub>, TiO<sub>2</sub>, SiN, and combinations thereof; and

second reflecting means, situated above said confinement means, for reflecting light, the second reflecting means comprising a plurality of layers comprised of InP, InAlAs, or AlAsSb.

15. **(Previously Presented)** The vertical cavity surface emitting laser of claim 14, wherein said first means for reflecting comprises first distributed Bragg reflector layers including one or more materials that are at least nearly lattice matched with the substrate and wherein said second reflecting means comprises second distributed Bragg reflector layers.

16. **(Previously Presented)** The vertical cavity surface emitting laser of claim 15, wherein said active means is at least nearly lattice matched with said first means for reflecting.

17. **(Previously Presented)** The vertical cavity surface emitting laser of claim 16, wherein the substrate comprises InP.

18. **(Previously Presented)** The vertical cavity surface emitting laser of claim 16, wherein the substrate comprises GaAs.

19. **(Withdrawn)** A method for manufacturing a laser source comprising:  
forming a first reflector;  
forming a cavity situated above said first reflector;  
forming a layer of dielectric, having an opening formed therein, the layer of dielectric formed using a dielectric deposition process, the layer of dielectric situated above said cavity;  
forming a second reflector situated above said layer, wherein the first reflector, the cavity and the second reflector are formed using an eptiaxial growth process.

20. **(Withdrawn)** The method of claim 24, wherein said first reflector is situated on a substrate.

21. **(Withdrawn)** The method of claim 20, wherein said first reflector is at least nearly lattice matched with the substrate.

22. **(Withdrawn)** The method of claim 21, wherein the laser source has an InP based structure.

23. **(Withdrawn)** The method of claim 21, wherein the laser source has a GaAs based structure.

24. **(Withdrawn)** The method of claim 19, wherein said layer comprises at least one material selected from of a group of  $\text{SiO}_2$ ,  $\text{TiO}_2$ , and  $\text{SiN}$ .

25. **(Withdrawn)** A method as in claim 8 wherein the aperture is formed using a lift off technique.

26. **(Withdrawn)** A method as in claim 8 wherein the aperture is formed by etching a portion of the dielectric material.
27. **(Withdrawn)** A semiconductor laser manufactured according to the method of claim 19.
28. **(Withdrawn)** A semiconductor laser as in claim 27, wherein said layer comprises at least one material selected from the group consisting of SiO<sub>2</sub>, TiO<sub>2</sub>, SiN, and combinations thereof.